

THERE IS CLAIMED :

1. Tapping unit, including:

- a casing adapted to be fixed facing a part to be machined on a support of a machine tool such as a press and having an interior housing,
- a pattern including a bush with a tapped bore inserted axially in the interior housing of the casing and prevented from rotating by immobilizing means,
- a tap-carrier including means for receiving and retaining a tap, having a threaded section functionally engaged in the tapped bore of the pattern, and having a drive section,
- a drive shaft, rotatably mounted in the casing, having a bore receiving the drive section of the tap-carrier, which is adapted to slide longitudinally in it, and driven in rotation by a mechanical transmission driven by a motor,
- means which allow slight and limited radial movement of the tap in the casing about a mean radial position,
- and means which allow limited forward axial movement of the tap toward the exterior of the casing from a reference position and against the action of return spring means.

2. Tapping unit according to claim 1, wherein the means which allow limited axial advance movement of the tap include:

- an axial bore in the casing in which the pattern can slide longitudinally between the reference position and a retracted proximal position,
- a posterior distal shoulder in said axial bore in the casing,
- an anterior distal shoulder on the pattern, facing the posterior distal shoulder in the bore, with an appropriate axial distance between said shoulders when the pattern is in a reference position,

2) - an advance compression return²⁰ spring inserted in the axial bore in the casing between the anterior distal shoulder¹⁶ of the pattern and the posterior distal shoulder of the bore in order to push the pattern axially back in the retraction direction.

3) ²⁰ 3. Tapping unit according to claim 1, including return spring means which return the tap-carrier to a centered radial position in the casing.

4. Tapping unit according to claim 1, wherein the means which allow slight and limited radial displacement of the tap in the casing include:

- the fact that the drive section is a proximal section of the tap-carrier,
- the fact that the tap is held fixedly in the tap-carrier,
- a slight radial clearance between the polygonal cross section bore in the drive shaft and the proximal drive section of the tap-carrier,
- an appropriate radial clearance between the pattern and the axial bore in the casing that guides it laterally, so that the tap-carrier, the tap and the pattern form an autonomous subassembly able to move in the fixed casing with a slight and conical oscillatory movement.

5. Tapping unit according to claim 1, further including means which allow limited axial retrograde movement of the tap toward the interior of the casing from the reference position and against the action of return spring means.

6. Tapping unit according to claim 5, wherein the means which allow limited axial retrograde movement of the tap include:

- a proximal posterior shoulder on said axial bore of the casing,
- a corresponding proximal posterior shoulder on the pattern,

- a retraction return spring,¹⁸ inserted in the interior housing of the casing between the proximal posterior shoulder of the pattern and a front bearing surface of the casing, in order to retract the pattern axially in the forward direction, the thrust of the retraction return spring being inhibited by the proximal posterior shoulder of the axial bore in the casing when the pattern is at or downstream of its reference position.

7. Tapping unit according to claim 6, wherein a thrust ring¹⁹ is slidably engaged in the interior housing of the casing and around the pattern, between the distal end of the retraction return spring and the respective posterior shoulders on the pattern and in the axial bore in the casing.

8. Tapping unit according to claim 1, including sealing means disposed between the pattern and the tap-carrier at the distal outlet of the bore in the pattern, in order to oppose polluting fluids reaching the co-operating threads of the tapped bore in the pattern and the threaded section of the tap-carrier.

9. Tapping unit according to claim 1, wherein the mechanical transmission includes a flexible drive shaft functionally connecting a remote motor to the mobile members of the casing.

10. Press for forming and machining parts, including a tapping unit according to claim 1, the casing of the tapping unit being fixed to the part-carrier of the press with the tap facing toward the part to be machined, so that the freedom of radial and axial movement of the tap allows it to follow unwanted movements of the part to be machined on the part-carrier during tapping.